

## Route Description

MR. FISH: Thank you very much, Colonel.

I have spent the last approximately 30 years of my life beating around the desert in Mexico and the Southwest promoting and organizing off-road races, of which I would assume most of you know the most famous one, the Tecate SCORE Baja 1000, which this is our 30th anniversary, and I would like to take a moment and thank Dr. Tether for bringing me out of the desert and hopefully trying to clean up my act and help design the route for this Challenge, which is a challenge on my part, it really is.

Last night, we had a little mixer and a lot of you were there. The questions that were asked of me were wanting to know the actual course. Well, obviously, I can't do that.

You will get that information two hours before your departure on race day.

But I would like to clarify a couple of things. We have been talking about 300 miles. It is approximately 300 miles, but there are going to be two stages that will not actually be race miles, and that is the ribbon cutting at Anaheim, as Dr. Tether mentioned earlier, and that is on a Thursday, and then the vehicles or systems, or whatever we

1 are really calling these entries, will be transported to the  
2 California Speedway, and at that point, on Friday, there will  
3 be a technical inspection and also a small course that will  
4 make sure that these units comply with all the rules and  
5 regulations, and can do the things that you said in your  
6 papers that you will be able to do.

7           Then, from there, will be transported or you will  
8 transport your system to an area in the Barstow area, and  
9 again I am trying to be as vague as I can here, but we would  
10 like you to know what part of the country you should start  
11 thinking about ending up on Friday evening for the start of  
12 the event on Saturday morning.

13           So, again, it is more like approximately 250 miles  
14 of actual off-road, trail, dry lake bed terrain type, and  
15 some pavement, actual competition driving, so some of you  
16 that are concerned about the time constraint, it is not 300  
17 miles, it is going to be somewhere, let's say, between 225  
18 and 250 miles.

19           I have had the opportunity over the last few months  
20 to go look at some very, very challenging terrain in  
21 California and Nevada. We have not decided on a course yet.  
22 We have a lot of things that we have to go through with the

1 different governmental agencies to make sure that we can  
2 conduct this event in a safe and prudent manner.

3           Next slide, please.

4           I just want to go over some slides here and show  
5 you some of the types of terrain that we are going to include  
6 in the Challenge. As you can see, this is a paved street.  
7 It is actually a street in a community. It is actually a  
8 community that we will, in one of the three proposed routes,  
9 that we will go through, so your system will have to be able  
10 to negotiate that type of terrain, namely, pavement with a  
11 curb on the side, traffic lights -- which we will be closing  
12 down obviously any oncoming traffic or traffic lights, or  
13 things of that nature.

14           Next slide, please.

15           Here is an overpass and obviously, again, please  
16 excuse me for some of my ignorance, because what Dr. Scott  
17 Fish was talking about, believe me, is way over my head. You  
18 know, I am really an off-road goofball, that's what I am, you  
19 know, and we don't have these types of systems that we can  
20 train, we have to use our own brains. But I must mention at  
21 this time I think some of our competitors might be autonomous  
22 that compete in my event, so I don't know, but you will

1 obviously have to negotiate this and make sure you do not  
2 fall over the sides of this overpass and land on a freeway of  
3 some sort, so we basically said there is somewhere between 1  
4 and 10 percent on terrain like this overpass.

5           Then, we have what we call unsurfaced -- next  
6 slide, please -- unsurfaced roads, which this is where you  
7 will be able to make up the speed that is necessary to finish  
8 the Challenge. Here is the opportunity to let the system go  
9 full out.

10           The question I think that I have, and we have been  
11 talking about with the DARPA people, is the manned vehicle  
12 that will be your safety vehicle. I think you should pay a  
13 lot of attention to who will be driving that vehicle and the  
14 setup on that.

15           You will have to go by the SCORE rules and  
16 regulations which you will be getting on the web site, on the  
17 DARPA web site, which explains the technical aspect of what  
18 that safety vehicle must have, because that individual is  
19 going to be a very talented individual to stay up with your  
20 system.

21           So, as you can see, you will be able to make up  
22 some time on surfaces like this. We do have somewhere

1 between 40 and 60 percent that will be similar to this, but  
2 there will be narrow, wider, some washboard, some berms, and  
3 some moguls, which we refer to in off-road, and then also on  
4 surface, which will be -- next slide -- which will be narrow,  
5 very hilly, switchback-type terrain, which as you can see if  
6 you go over to the side, you will be down in a gully and even  
7 if you had that vehicle that throws its arms out and turns it  
8 over, I think it would be very difficult to get out of that  
9 situation, so you do not want to be down in that gully.

10           Next slide.

11           We have some areas in one of the proposed routes  
12 that will be actually paralleling some railroad tracks, which  
13 kind of make it very interesting, and naturally, with my  
14 luck, there will be a railroad coming the opposite way as  
15 your unit is going next to it, so you are going to have to  
16 really have your sensors working at that time.

17           Next slide.

18           Twenty to 30 percent of the proposed route will be  
19 on terrain similar to this, what we are calling hard pack.  
20 Again, it will be fast terrain, but as you can see, if you  
21 can see the tire marks on there, that's a gully, and your  
22 system is going to have to be able to read obviously the

1 difference between a washout or a shadow from some of the  
2 bushes.

3           You can see that the individual that was driving  
4 this one kind of did a little fishtail there, and I assume  
5 that you are going to have a lot of that during your time  
6 period.

7           Next slide.

8           Some very interesting terrain. We have a challenge  
9 to include in that 20 to 30 percent some very silty, talcum  
10 powder type terrain that will be, you know, as you are  
11 traversing it, you will have the silt coming up over your  
12 sensors or what have you, however you are going to operate  
13 your system. But it also has some pretty good deep holes in  
14 it and some moguls that, you know, really make it  
15 interesting.

16           Next slide.

17           And we will go over some ridge tops. Again, it is  
18 kind of hard to see the actual grade here, but this is a  
19 pretty good size grade there, and you have to be able to  
20 negotiate that left-hand turn and to make sure that it does  
21 stay left, that all of a sudden it's not a switchback coming  
22 the other way and you are caught in mid-air with no way to

1 turn that vehicle, so this is going to be a real challenge, I  
2 think.

3           As you can see, it's a typical desert type terrain  
4 on either side of you. There will be areas that by way of  
5 GPS and other I guess route definitions will allow you to  
6 make a decision whether you want to stay on that particular  
7 trail or, let's say, go to the left or right. There will be  
8 areas throughout the course that will have that opportunity.

9           Next slide, please.

10           Then, as part of this about 20 to 30 percent we  
11 also have very, very rocky, volcanic type rocks that are over  
12 the course, and again, the site looks like it is very easy.  
13 I have had, as I said, the pleasure, opportunity, or  
14 misfortune to be able to drive over three proposed courses,  
15 and this is a real tire-eater, I will tell you. Those are  
16 very sharp rocks, and it's very challenging.

17           Next slide.

18           Then, we have some, about 5 to 20 percent, which we  
19 are going to call like an open area that has some ruts and  
20 small bushes, and different types of vegetation, and contrary  
21 to what you saw in that robotic vehicle, you know, just  
22 knocking down trees and things of that nature, that is not

1 what our intent is. We are going to conform with all of the  
2 environmental requirements, which are quite stringent, both  
3 in California and Nevada.

4 We are not running amuck out in the desert. We are  
5 there to accomplish something that hopefully will benefit our  
6 country, and we are going to be doing it in a very safe and  
7 prudent manner.

8 Next slide.

9 Here is a great fun part of the Challenge on some  
10 dry lake beds, which will makeup the rest of that 5 to 20  
11 percent. This is absolutely, it looks like Bonneville salt  
12 flats for those of you that have ever witnessed any speed  
13 trials, it is flat out, as fast as you can go.

14 There is, depending again on what Mother Nature  
15 does, I was out on basically the same type of terrain last  
16 Wednesday, and the vehicle I was in, which was a stock F150  
17 Ford, I was able to go about 90, 95 miles an hour on that.  
18 But then again, it rained about two days before, and there  
19 were a couple of little gotchas right in the middle of that  
20 and you had to be prepared to make sure that you didn't tip  
21 over on that.

22 But this is going to be exciting terrain and in all



1 of the courses, we have some of this.

2           Next slide.

3           Water crossings, which we are going to have no  
4 matter what course we use, are very exciting, and I think  
5 they are going to definitely be a challenge.

6           This particular shot was done about three weeks  
7 ago, prior to the rains, and I went back on Wednesday, as I  
8 said, in an area similar to this, and if we had a vehicle,  
9 taken a picture of my vehicle, the water was basically up  
10 over the -- I believe that's a -- I don't know what that is  
11 -- but anyway, in the Ford it was up over the grille and it  
12 was quite interesting.

13           But anyway, you are going to have exactly this type  
14 of terrain, and again I am having a hard time understanding  
15 how a sensor or a computer, or whatever it is, is going to be  
16 able to start at that side and figure out that, yes, there  
17 are tracks on that side and I can make it, or do I go around  
18 it, or do I turn around and go home. I am not sure, but  
19 anyway.

20           Next slide.

21           Again, a typical water type crossing that you will  
22 encounter. This one here is a little more fun because it has

1 a ridge on it, and again, coming through that, you are going  
2 to have to have a little speed and then what do you do when  
3 you get to the other side.

4           Next slide.

5           We have -- and as you can see, we blocked these  
6 out, so you wouldn't know where this is obviously, because I  
7 am sure if you are like off-road racers, by the time this is  
8 over, you would already be out figuring out exactly where  
9 that underpass is, and you would be pre-running right now,  
10 which we obviously are not going to allow.

11           But this creates a very interesting challenge  
12 because obviously, there is a height and a width situation  
13 here. I think in our rules, it's a maximum of 10 feet wide  
14 and 9 feet high, and you can see why, because it would be  
15 rather embarrassing for everyone if you got to this point,  
16 and, you know, you would turn into a sardine can.

17           And what is on the other side of this, I think is  
18 kind of interesting, because they didn't show it, but this  
19 particular route, I mean that is as fantastic as I can  
20 imagine and what I like to see in off-road racing, and that  
21 is a challenge. There are some silt beds on the other side of  
22 this with moguls, and if you are familiar with skiing, you

1 know that is what I am referring to, these moguls, but these  
2 are moguls, not for skis. I mean this is horrendous. This  
3 is going to be a great photo opportunity or Kodak moment  
4 right there.

5               Next slide.

6               Again, you know, my background is, although I think  
7 besides Dr. Tether, I wore a suit because, you know, these  
8 Washington guys, normally, I am in shorts or levis or  
9 whatever, and again, Dr. Tether was able to hose me off and  
10 get me cleaned up for this meeting.

11              But they said, well, you know, we are going to make  
12 obstacles. Well, I think after the second or third time that  
13 some of these people from Washington were out on the course  
14 with me, they realized that Mother Nature has already made  
15 the obstacles, and between now and March of next year, those  
16 obstacles will change even from what we design, so I don't  
17 think it's necessary for us to do anything more than what we  
18 have, and this being an obstacle that is obviously a very,  
19 very narrow pass here, very high climbing up to this, and  
20 going down is an E-ride as far as I am concerned when I was  
21 driving, so you will enjoy this part of it.

22              As a result of last night, I am sure or I am hoping

1 that you will have a lot of questions for me, but  
2 unfortunately, I think I am going to have to just reiterate  
3 on what I said this afternoon here, or this morning, excuse  
4 me.

5 I can't tell you where the course is obviously, so  
6 what I can tell you is that, first of all, you have to build  
7 an incredible system to complete the course. This is a  
8 challenge.

9 My job is -- and I shouldn't say that because no  
10 one at DARPA, I am not at DARPA -- but I do have a job, but I  
11 think it's a job that a lot of people have envied because I  
12 get to play in the desert all the time, every day, seven days  
13 a week, where most people dream about that during the week  
14 and do it on the weekend, so I would like to consider I  
15 really don't have a job, so maybe I am part of you guys.

16 But you have given me a job in making this a  
17 challenge from the standpoint that hopefully, we will have a  
18 finisher, but as Dr. Tether said, this is a challenge, and we  
19 are, the people sitting in this room I think have an  
20 opportunity to be a part of something that has never been  
21 done, and what a rare opportunity I think that is to be a  
22 part of that.

1           I mean we will look back, if we come back here  
2 maybe 25 years from now, or 50 years, or 10 years, the  
3 vehicles that you see in this excellent museum might be the  
4 vehicles that started this DARPA Challenge, and these will be  
5 common vehicles that we will see, and I think that is the  
6 goal that DARPA is trying to do.

7           I personally, and the off-road community which  
8 SCORE represents, I think are very delighted to have the  
9 opportunity to participate in it. So, again, I look forward  
10 to answering any questions you have, but, please understand  
11 that I have been sworn, signed off, all the things that are  
12 necessary, that I cannot tell you a lot more except maybe to  
13 describe the terrain and what I would suggest as a vehicle  
14 that will be your safety vehicle.

15           Again, thank you very much. I look forward to  
16 seeing you throughout the year.

17           [Applause.]

18           COL NEGRON: Okay. We have reached our mandatory  
19 break period. We are going to take 30 minutes. This is a  
20 great opportunity for you guys to mingle, talk to our staff,  
21 so please take a break. Remember the restroom is on the  
22 first and third floor. Thank you very much.